KINECTS AND FACTORS ON CHEMICAL DISSOLUTION OF ALUMINUM ALLOY AA6061 IN NaOH ALKALINE MEDIA

Reference	Presenter	Authors (Institution)	Abstract
01-179	Eriki Masahiko Takara	Takara, E.M. (IPEN/CNEN-SP); de Souza, J.B. (IPEN/CNEN-SP); URANO CARVALHO, E.F. (IPEN/CNEN-SP); SILVA, A.S.(Instituto de Pesquisas Energéticas e Nucleares);	Nuclear Medicine is the Field of science that uses radioactive materials in order to diagnose and treat human body deceases. One of the most used radioisotopes for images diagnose purpose is the metastable technetium-99 (99mTc) because of its low decay half life (6 hours) and energy emission of 140keV that ensures low exposition time with the capacity of generating high quality images. The 99mTc is generated by the molibdenum-99(99Mo) radioactive decay during about 66 hours. The 99Mo is fabricated via nuclear fission of low encriched uranium (LEU) through plate irradiation targets (UAlx). The irradiation target cladding is made of Aluminum alloy AA6061 and its substrate is composed by 235U powder scattered in an AA1050 matrix. In general, studies are made targeting the prevention of corrosion mechanisms but the chemical dissolution in alkaline media, under hot cells, are one of the steps required for the post-processing methods of irradiation targets The time spent after irradiation is an important factor because the half life radioactive decay of the produced radioisotopes is relative short, then the procedures of dissolution, extraction, purify and distribution must be optimized in order to increase efficiency. This work presents a study of the factors impact involved on the chemical dissolution of the cladding aluminum alloys (temperature, NaOH solution concentration and dissolution time) as well as the kinects of the process associating it with the formation and destruction of oxides using electrochemical impedance spectroscopy (EIS) and scanning electron microscopy (SEM). It was found that the involved parameters contribute individually more effective and that there is no relevant association between the factors. Solution temperature showed to be the most influent factor following by exposition time. It was presented a equivalent circuit model which demonstrates the reaction kinects and the growing of passive layers that slow down the process before it turns up into a soluble phase.

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